

REMARKS

Applicant has amended claims 1, 2 and 5, and added new claims 6-8. Claims 1-8 are pending in this application.

In the Office Action, the Examiner objected to the word "of" in line 2 of claim 2. Applicant has deleted the word "of" from claim 2 according to the Examiner's suggestion.

The Examiner rejected claims 1-5 under 35 U.S.C. Section 102 as being anticipated by Kitahara (US Patent No. 5,332,890). Applicant respectfully traverses the rejection.

Prior Art

According to the prior art as disclosed in FIG. 15, a flexible connection cable 107 such as a flexible printed cable ("FPC") is used to connect the contacts 104 of a contacts block 105 to an IC card control circuit board (not illustrated) where the transmission of data is controlled. The connection cable 107 follows the contacts block 105 so that the movement of the contacts block 105 is not hindered.

As the data transmission speed increases, however, the long cable distance between the IC card 102 and the IC card control circuit board starts to become problematic. When an FPC or a lead is used, the mechanism is vulnerable to noise caused between the lines (cross-talk), disturbance, etc. When the signal lines of the connection cable 107 are wired in parallel over a long distance, the cross-talk occurs as an interference between the signals at the peaks or valleys of the signals, causing errors in operation. This is particularly serious when the data transmission rate of the IC is very high.

In prior technology, a condenser was mounted between the terminals to remove noise. However, at a high data transmission rate, its effectiveness is reduced because of the corruption of the clock signals. Alternatively, the connection cable may be shielded. However, this method increases the cable's rigidity, possibly hindering the movement of the contacts block 105.

Present Invention

The present invention according to claim 1 discloses a novel contacts block mechanism that solves the above stated problems. In accordance with the invention, a IC card control circuit

board (see 7a in FIG. 1) is mounted to the contacts block 4 so as to eliminate the long cable between the IC card control circuit board and the IC contact card 2 as was previously necessary. Therefore, the wiring distance between the I/O terminal of the IC contact card and the IC on the control circuit board can be short, thus preventing noise from being generated in the long connection cable (see specification, page 11, lines 1-11).

Claim 1 has been slightly amended to recite this feature more clearly as "an IC card control circuit board **mounted to said contacts block**, to which one end of said contacts is electrically connected for signal transmissions with said IC card" (emphasis added). Thus, communication occurs between the IC card and the IC card control circuit board without using the long connection cable that was necessary in the prior art.

The Examiner asserts that the terminal holder of Kitahara rotates to make electrical contact with the IC terminal as claimed in claim 1. While that may be a correct characterization of Kitahara, applicant submits that Kitahara does not teach mounting an IC card control circuit board to a contacts block as recited in claim 1. Kitahara suffers from the same problem as the prior art device because Kitahara apparently also uses a connection cable 120 (FPC) to transmit data to a control circuit board which is apparently located somewhere in the main body of the card reader (see col. 3, lines 13-21).

By contrast, claim 1 recites that the IC card control circuit board is mounted to the contacts block (terminal holder 6 in Kitahara) to eliminate such a long connection cable to prevent cross-talk noise in the cable wires.

Claims 2-5 are also patentable by virtue of their dependency from parent claim 1.

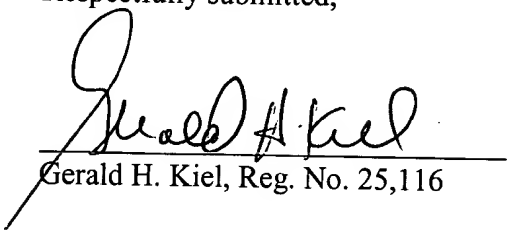
Applicant has added new claims 6-8. Claim 6 recites the novel feature "a control circuit board mounted to the contacts block for movement with the contacts block" and "the control circuit board being operable to communicate with the IC contact card". None of the cited references teach or suggest such a novel combination. Claims 7-8 are also patentable by virtue of their dependency from parent claim 6.

Based upon the above amendments and remarks, applicants respectfully request reconsideration of this application and its early allowance. Should the Examiner feel that a telephone conference with applicants' attorney would expedite prosecution of this application,

the Examiner is urged to contact him at the number indicated below.

Respectfully submitted,

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GHK/HKA:mvk
Reed Smith LLP, 29th Floor
599 Lexington Avenue
New York, NY 10022-7650


Gerald H. Kiel, Reg. No. 25,116

MARKED-UP CLAIMS:

Please amend the following claims.

1. (Amended) A contacts block mechanism of an IC contact card reader having a contacts block that contacts an input/output terminal on a card surface of an IC contact card for signal transmissions, comprising:

contacts placed in said contacts block for making contact with said input/output terminal;

contacts attach/detach means for moving said contacts block into contact with or away from said input/output terminal; and

an IC card control circuit board mounted to said contacts block, to which one end of said contacts is electrically connected for signal transmissions with said IC card.

2. (Amended) The contacts block mechanism of an IC contact card reader as set forth in Claim 1 wherein said contacts attach/detach means includes [of] a swing arm that turns said contacts block into contact with or away from said input/output terminal and an actuator for driving said swing arm.

5. (Amended) The contacts block mechanism of an IC contact card reader as set forth in Claim 1, further comprising:

[contacts placed in said contacts block for making contact with said input/output terminal;]

[contacts attach/detach means for moving said contacts block into contact with or away from said input/output terminal;]

[an IC card control circuit board, to which one end of said contacts is electrically connected for signal transmissions with said IC card; and]

a frame, to which said members of said contacts block mechanism are fixed, and which, in turn, is attached to a predetermined position in said IC contact card reader.

Please add the following new claims.

-- 6. (New) An IC contact card reader comprising:

a contacts block operable to contact an I/O terminal disposed on an IC contact card, the contacts block including:

contacts disposed in the contacts block for contacting the I/O terminal of the IC contact card; and

a control circuit board mounted to the contacts block for movement with the contacts block, one end of the contacts being electrically connected to the control circuit board, the control circuit board being operable to communicate with the IC contact card; and

a contacts block mover operable to bring the contacts block into contact with the I/O terminal of the IC contact card and to move the contacts block away from the I/O terminal.

7. (New) The IC contact card reader as set forth in Claim 6 wherein the contacts block mover includes:

a swing arm that turns the contacts block towards or away from the I/O terminal of the IC contact card; and

an actuator for driving the swing arm.

8. (New) The IC contact card reader as set forth in Claim 1 wherein the contacts block mover includes a switch and a moving member, the switch being capable of making contact with or separating from the IC contact card during transporting, and said moving member being linked with the movement of the switch for bringing the contacts block into contact with the I/O terminal. --